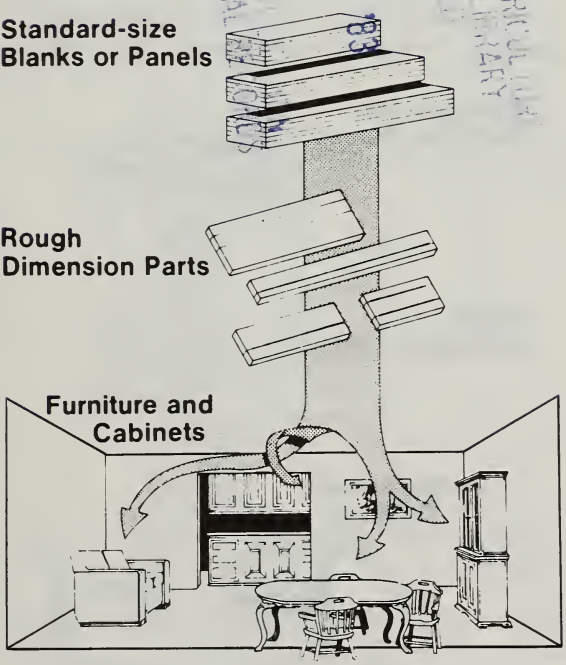
Program BLANKS Analyzes Rough-Part Needs in Standard-Size Blanks



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Program BLANKS
Analyzes Rough-Part Needs in Standard-Size Blanks

by Philip A. Araman

Standard-size blanks as raw material for the furniture manufacturing process is a new concept that promotes the use of a few standard sizes of ready-to-use, edge-glued blanks to produce thousands of different parts (Fig. 1). Before a company adopts the use of blanks, it must be convinced of the merits of the concept.

A key question is: How well and at what cost do blanks meet the actual needs of any given company? To provide the answer quickly, we used a computer program called BLANKS. The program determines the number of edge-glued, standard-size blanks required for each species-thickness-quality combination of rough parts specified by a company. Parts needs can

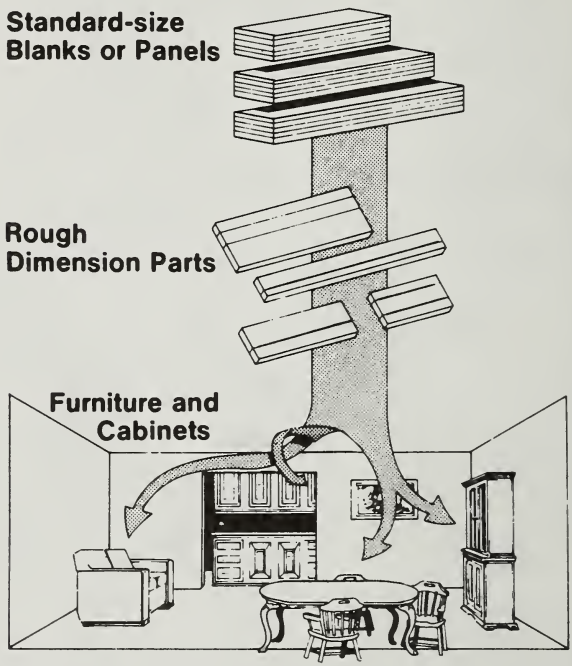

Figure 1.—*The standard-size blanks concept. Standard-size blanks are processed to rough-dimension parts that are used to make furniture and cabinets.*

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be for a piece of furniture, any number of pieces in a suite or group of furniture, or for any combination of pieces of furniture. The results from program BLANKS provide the number of standard-size blanks needed, yield information, and cost information for any production period.

Program Inputs

The input data include the standard blank sizes[1] and their value per square foot along with the rough-part lengths, widths, and quantities needed. Quantities needed are determined by multiplying the number of parts needed for the item times the number of items needed for the production period.

Program Outputs

After the simulator has produced all of the required parts from blanks, summaries are calculated and the results are printed. The printout includes: blank length, blank width, number needed, square feet in blanks used, square feet in parts produced, yield of parts in percent, total cost of the parts, regluable material in percent, regluable material value, end-trim waste in percent, edge and ripping waste in percent, and total waste in percent. Totals for each species-thickness-quality combination also are provided.

Uses of Output

The results generated by program BLANKS can be used by a manufacturer to:

- Evaluate standard-size blanks as a solid wood input material.
- Consider a blanks inventory system.
- Decide what to make or buy and inventory as standard-size blanks.
- Decide what to make or buy in exact rough-part dimensions if total adoption of the standard sizes is not desired.
- Decide which low-demand species-thickness parts should be made with a more highly demanded species-thickness.

Blanks allow two new opportunities: (1) closer rough-dimension tolerances, and (2) minor design

[1]Araman, Philip A.; Gatchell, Charles J.; Reynolds, Hugh W. **Meeting the solid wood needs of the furniture and cabinet industries: Standard-size hardwood blanks.** Res. Pap. NE-494. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1982. 27 p.

changes that give major savings. Because blanks are made of kiln-dried and defected wood, smaller rough-dimension sizes can be specified. New groups of furniture could be designed with the standard sizes and then analyzed by program BLANKS on the basis of cost and yield information before production. Slight design changes before production can improve yields and reduce costs.

After working with program BLANKS output, the manufacturer probably will find other uses.

An Example Analysis

We used the program to analyze the 90-day needs for a manufacturer of occasional tables and other living room furniture. The company produced furniture for 14 different suites or groups during the selected 90-day production period. More than 261 different designs, mostly tables, had to be made. A total of 39,800 pieces of furniture were made during the production period. To make this furniture, six species and 25 species-thickness-quality combinations were required.

Program BLANKS was used to analyze 102 sets of requirements. One of the summary output listings for a 4/4 cherry clear-quality blanks analysis is shown in Table 1. Table 2 shows the results for all the company's 4/4 cherry clear-quality blank needs. The totals are the company's 90-day needs.

So the manufacturer could see the improvements that are possible if the rough-part lengths were more in line with the standard sizes, we ran some additional simulations with adjusted data. We reviewed the Group B 4/4 cherry requirements and where the rough-part length was longer than the standard length, by 1/2 inch or less, we reduced the part length to the standard length and reran BLANKS. Table 1 presents the original results and Table 3 the adjusted results. The changes show better conversion utilization and lower costs and make the distribution of blanks shorter.

The computer program described in this leaflet is available on request with the understanding that the U.S. Department of Agriculture cannot assure its accuracy, completeness, reliability, or suitability for any other purpose than that reported. The recipient may not assert any proprietary rights thereto nor represent it to anyone as other than a Government-produced computer program. To obtain a copy of the computer program, please write: Northeastern Forest Experiment Station, Forestry Sciences Laboratory, P.O. Box 152, Princeton, WV 24740.

Table 1.—Summary of parts from standard-size blanks—Group B 4/4 cherry clear-quality requirements

Blank size (inches)	Number needed	Blank	Parts	Yield	Total cost	Reglu-able	Reglu-able value	End waste	Edge waste	Total waste
		– – – ft² – – –		Percent	Dollars	Percent	Dollars	– – – – Percent – – – –		
15×26	16	43	36	0.83	63.27	0.01	0.83	0.07	0.09	0.15
18×26	137	445	376	.85	650.06	.00	1.25	.08	.07	.15
21×26	75	284	259	.91	415.19	.00	.87	.04	.05	.09
25×26	25	113	90	.80	164.76	.04	5.96	.09	.07	.16
29×26	58	304	255	.84	443.39	.01	5.32	.07	.08	.15
33×26	44	262	241	.92	382.76	.01	4.16	.00	.07	.07
38×26	78	535	454	.85	781.34	.01	8.71	.05	.09	.14
Total	433	1,987	1,712	0.86	2,900.78	0.01	27.10	0.05	0.08	0.13

Table 2.—Summary of company's 90-day needs for 4/4 cherry clear quality in standard-size blanks

Group	Blank size (inches)									
	15×26	18×26	21×26	25×26	29×26	33×26	38×26	45×26	50×26	60×26
	No. of blanks									
B	16	137	75	25	58	44	78	—	—	—
D	849	1,906	959	1,818	622	277	16	51	203	38
F	72	148	167	106	25	—	—	—	54	—
H	204	120	115	772	50	19	400	25	—	—
I	95	35	86	379	27	—	300	37	—	—
M	310	70	185	54	9	7	9	—	27	—
Total	1,546	2,416	1,587	3,154	791	347	803	113	284	38

Table 3.—Summary of parts from standard-size blanks—Group B 4/4 cherry clear-quality requirements after making changes in part lengths

Blank size (inches)	Number needed	Blank	Parts	Yield	Total cost	Reglu-able	Reglu-able value	End waste	Edge waste	Total waste
		– – – ft² – – –		Percent	Dollars	Percent	Dollars	– – – – Percent – – – –		
15×26	79	214	192	0.90	312.38	0.00	0.00	0.01	0.09	0.10
18×26	80	260	218	.84	379.60	.11	41.70	.02	.03	.05
21×26	75	284	259	.91	415.19	.00	.87	.04	.05	.09
25×26	50	226	192	.85	329.51	.02	5.73	.04	.09	.13
29×26	33	173	151	.87	252.28	.02	5.70	.03	.07	.11
33×26	59	352	316	.90	513.25	.01	6.81	.00	.09	.09
38×26	64	439	378	.86	641.10	.01	8.44	.04	.09	.13
Total	440	1,947	1,706	0.88	2,843.31	0.02	69.24	0.03	0.07	0.10